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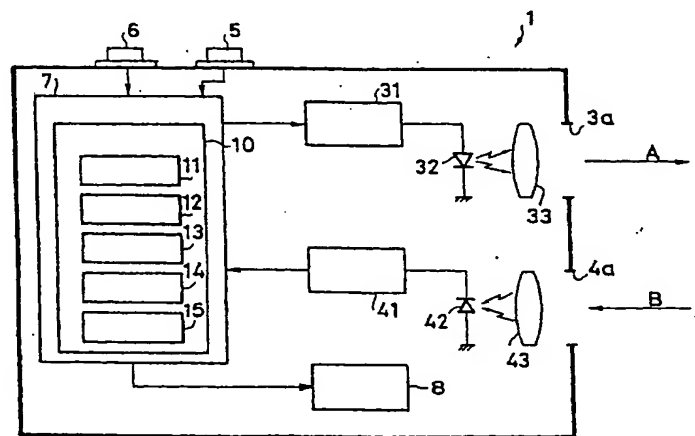
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DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).

添付公開書類:  
— 国際調査報告書

2文字コード及び他の略語については、定期発行される  
各PCTガゼットの巻頭に掲載されている「コードと略語  
のガイダンスノート」を参照。

発明の名称: RANGE FINDER, RANGE FINDING METHOD, AND PHOTOELECTRIC TRANSDUCING CIRCUIT

発明の名称: 測距装置、測距方法および光電変換回路



Abstract: A range finder (1) comprises a laser beam emitter (3) for emitting a pulse laser beam, a reflected light beam sensor (32) for receiving the reflected beam, a distance calculating unit (10) for calculating the distance from the elapsed time until the reflected light is received, and a distance displaying unit (8) for displaying the distance. The distance calculating unit (10) has a counting section (11) for counting the frequency of when the reflected beam satisfies a predetermined condition, a table creating section (12) for creating a frequency table by accumulating the counts and relating them to distances, a distance determining section (13) for determining the distance where the frequency exceeds a threshold in the frequency table as the distance to the object, and a distance selecting section (15) for selecting a predetermined distance when a plurality of distances are determined and allowing a distance displaying section (8) to display the selected distance. Thus the distance is adequately displayed even if a plurality of distances are determined. The ease of use and the function are improved.

[続葉有]

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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP02/04122

## A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl<sup>7</sup> G01S17/10, H01L31/10

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl<sup>7</sup> G01S7/00-7/51, 13/00-13/95, 17/00-17/95, G01B11/00-11/30

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1926-1996	Toroku Jitsuyo Shinan Koho	1994-2002
Kokai Jitsuyo Shinan Koho	1971-2002	Jitsuyo Shinan Toroku Koho	1996-2002

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	JP 10-68775 A (HE Holdings, Inc. dba Hughes Electronics), 10 March, 1998 (10.03.98), Full text; all drawings & CA 2203598 A & NO 971982 A & EP 805359 A2 & US 5760887 A	1-7, 9-42 8
Y A	Skolnik, Merril I: "Introduction to Radar Systems", Second Edition, Mcgraw-Hill, 1980, page 388, line 16 to page 389, line 10	1-7, 9-42 8
Y	JP 7-55941 A (Nissan Motor Co., Ltd.), 03 March, 1995 (03.03.95), Full text; all drawings (Family: none)	1-6, 10-15

☒ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"I" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search  
16 July, 2002 (16.07.02)

Date of mailing of the international search report  
30 July, 2002 (30.07.02)

Name and mailing address of the ISA/  
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP02/04122

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 60-201276 A (Nissan Motor Co., Ltd.), 11 October, 1985 (11.10.85), Page 6, upper right column, lines 2 to 18 & US 4699507 A	9
Y	JP 8-304535 A (Mitsubishi Electric Corp.), 22 November, 1996 (22.11.96), Full text; all drawings & DE 19541448 A1 & US 5739901 A & KR 201738 B	16-25
Y	JP 2-201186 A (Tokyo Keiki Co., Ltd.), 09 August, 1990 (09.08.90), Page 6, upper left column, line 17 to lower right column, line 10 (Family: none)	26-33
Y	JP 59-18472 A (Mitsubishi Electric Corp.), 30 January, 1984 (30.01.84), Full text; all drawings (Family: none)	39-42
A	JP 59-24278 A (Nippon Soken, Inc.), 07 February, 1984 (07.02.84), Full text; all drawings (Family: none)	3
A	JP 7-225892 A (Fuji Heavy Industries Ltd.), 22 August, 1995 (22.08.95), Full text; all drawings (Family: none)	1-42

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP02/04122

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Claims 1-42 are directed to a distance determining unit for determining that the distance at which the sum of the counts in a frequency table exceeds a predetermined threshold is the distance to the object or to a procedure to determine the distance.

Claims 43-45 are directed to a reverse bias voltage adjusting unit for adjusting the reverse bias voltage applied to an avalanche photodiode.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
  
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1 to 42

Remark on Protest ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.